## CLAIMS

The invention is claimed as follows:

1. A membrane capable of sensing a gas dissolved in a solution comprising:

a hydrophobic membrane layer including a polymeric compound containing fluorine wherein the hydrophobic membrane layer has a porous structure; and

a pH sensitive dye embedded within the porous structure of the hydrophobic membrane layer wherein the membrane is capable of colorimetrically sensing the gas.

2. The membrane of Claim 1 wherein the solution is a dialysate solution.

3. The membrane of Claim 1 wherein the porous structure of the hydrophobic membrane layer includes a pore size of about 9 microns or less.

4. The membrane of Claim 3 wherein the pore size ranges from about 2.5 microns to about 1 micron.

5. The membrane of Claim 1 wherein the polymeric compound containing fluorine is selected from the group consisting of polytetrafluoroethylene, polyvinylidene difluoride, acrylic-based fluorinated polymers, fluorinated ethylene propylene polymers, copolymers thereof and combinations thereof.

6. The membrane of Claim 1 wherein the polymeric compound containing fluorine consists essentially of polyvinylidene difluoride.

7. The membrane of Claim 1 wherein the pH sensitive dye is selected from the group consisting of bromophenol blue, bromothymol blue, phenol red, methyl orange, methyl yellow, 2,4-dinitrophenol, 2,6-dinitrophenol and mixtures thereof.

8. An ammonia sensor capable of detecting gaseous phase ammonia dissolved in a solution comprising:

a sensing membrane including a hydrophobic membrane layer composed of a fluorine-containing polymeric compound wherein the hydrophobic membrane layer includes a microporous structure having a surface defined by a plurality of strands within the microporous structure; and

a pH sensitive dye embedded on the surface of the microporous structure of the hydrophobic membrane layer wherein the pH sensitive dye is capable of selectively reacting with the gaseous phase ammonia such that the gaseous phase ammonia is colorimetrically detected.

9. The ammonia sensor of Claim 8 wherein the solution is a dialysate solution.

10. The ammonia sensor of Claim 8 wherein the fluorine-containing polymeric compound consists essentially of polyvinylidene difluoride.

11. The ammonia sensor of Claim 8 wherein the microporous structure of the hydrophobic membrane layer includes a pore size of about 2.5 microns or less.

12. The ammonia sensor of Claim 8 wherein the ammonia sensing membrane is capable of detecting a change in an amount of the gaseous phase ammonia within at least about three seconds.

13. The ammonia sensor of Claim 12 wherein the ammonia sensing membrane is capable of selectively detecting an increase in the amount of gaseous phase ammonia.

14. The ammonia sensor of Claim 12 wherein the ammonia sensing membrane is capable of selectively detecting a decrease in the amount of gaseous phase ammonia.

15. A method of producing a membrane capable of colorimetrically sensing ammonia dissolved in a solution comprising the steps of:

providing a hydrophobic membrane material including a polymeric compound containing fluorine wherein the hydrophobic membrane material includes a microporous structure;

providing a pH sensitive dye; and

adding the pH sensitive dye within the microporous structure of the hydrophobic membrane material.

16. The method of Claim 15 wherein the solution is a dialysate solution.

17. The method of Claim 15 wherein the pH sensitive dye is added to the hydrophobic membrane material by casting.

18. The method of Claim 17 wherein a casting solution of the hydrophobic membrane material and the pH sensitive dye is processed under acidic conditions to form the membrane.

19. The method of Claim 18 wherein the acidic conditions include adding an acidic solution containing methanol to the casting solution during processing.

20. The method of Claim 15 wherein the pH sensitive dye is added to the hydrophobic membrane material by dip coating.

21. The method of Claim 20 wherein the hydrophobic membrane is immersed in an aqueous solvent solution containing the pH sensitive dye during dip coating.

22. The method of Claim 15 wherein the polymeric compound containing fluorine is selected from the group consisting of polytetrafluoroethylene, polyvinylidene difluoride, acrylic-based fluorinate polymers, fluorinated ethylene propylene polymers, copolymers thereof and mixtures thereof.

23. The method of Claim 15 wherein the pH sensitive dye is selected from the group consisting of methyl orange, methyl yellow, 2,4-dinitrophenol, 2,6-dinitrophenol, bromophenol blue, bromothymol blue, phenol red and mixtures thereof.

24. A method of producing an ammonia sensing membrane comprising the steps of:

providing a hydrophobic membrane and a pH sensitive dye;

mixing the hydrophobic membrane and the pH sensitive dye into a casting solution;

processing the casting solution under acidic conditions to form the ammonia sensing membrane such that the pH sensitive dye is embedded within a microporous structure of the hydrophobic membrane.

25. A method of producing an ammonia sensing membrane comprising the steps of:

providing an aqueous solvent solution containing a pH sensitive dye;

providing a hydrophobic membrane having a microporous structure; and

immersing the hydrophobic membrane in the aqueous solvent solution such that the pH sensitive dye is embedded within the microporous structure of the hydrophobic membrane.

26. A method of detecting ammonia dissolved in a dialysis solution comprising the steps of:

providing an ammonia sensing membrane capable of detecting the ammonia wherein the sensing membrane includes a hydrophobic membrane layer composed of a polymeric compound containing fluorine and a pH sensitive dye embedded within a porous structure of the hydrophobic membrane layer; and

colorimetrically detecting a change in an amount of the ammonia with the ammonia sensing membrane during dialysis therapy.

27. The method of Claim 26 wherein the change in the amount of ammonia is detectable within at least about three seconds.

28. The method of Claim 27 wherein the ammonia sensing membrane is capable of detecting an increase in the ammonia dissolved in the dialysis solution.

29. The method of Claim 28 wherein the ammonia sensing membrane is capable of detecting an increase in the ammonia during dialysate regeneration.

30. The method of Claim 27 wherein the ammonia sensing membrane is capable of detecting a decrease in the ammonia dissolved in the dialysis solution.

31. The method of Claim 30 wherein the decrease in the ammonia is detectable to an amount of not less than about 0 ppm.

32. The method of Claim 26 wherein the hydrophobic membrane layer consists essentially of polyvinylidene difluoride.

33. The method of Claim 26 wherein the pH sensitive dye is selected from the group consisting of methyl orange, methyl yellow, 2,4-dinitrophenol, 2,6-dinitrophenol, bromophenol blue, bromothymol blue, phenol red and mixtures thereof.

34. A method of providing dialysis therapy comprising the steps of:

providing an ammonia sensor including a sensing membrane having a hydrophobic membrane layer composed of a fluorine-containing polymeric compound and a pH sensitive dye embedded within a porous structure of the hydrophobic membrane layer wherein the ammonia sensor is capable of colorimetrically detecting ammonia dissolved in a dialysate solution; and

selectively detecting an amount of the ammonia with the ammonia sensor.

35. The method of Claim 34 further comprising the step of monitoring and/or controlling toxin levels during dialysate regeneration based on the detectable amount of the ammonia dissolved in the dialysate solution.

36. The method of Claim 34 wherein the fluorine-containing polymeric compound is selected from the group consisting of polytetrafluoroethylene, polyvinylidene difluoride, acrylic copolymers, fluorinated ethylene propylene polymers and combinations thereof.

37. The method of Claim 34 wherein the pH sensitive dye is selected from the group consisting of methyl orange, methyl yellow, 2,4-dinitrophenol, 2,6-dinotrophenol, bromophenol blue, bromothymol blue, phenol red and mixtures thereof.

38. The method of Claim 34 wherein the porous structure of the hydrophobic membrane layer comprises a pore size of about 9 microns or less.

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